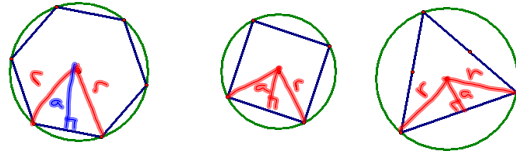


11-6 Areas of Regular Polygons

Any regular polygon can be inscribed in a circle.

Radius--from center to vertex

Apothem--from the center and perpendicular to one side



$$\text{Area} = \frac{1}{2} a p$$

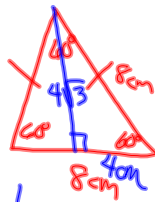
example 1:
regular hexagon
side = 8 cm



$$360 \div 6 = 60^\circ$$

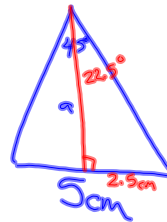
$$A = \frac{1}{2} 4\sqrt{3} \cdot 48 = 96\sqrt{3} \text{ cm}^2$$

perimeter of shape



$$\text{Area} = \frac{1}{2} a p$$

example 2:
regular octagon
side = 5 cm



$$\text{central } \angle = \frac{360}{8} = 45$$

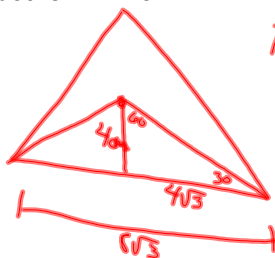
$$\tan 22.5 = \frac{2.5}{a}$$

$$a = 6.04$$

$$A = \frac{1}{2} 6.04 \cdot 40 = 120.8 \text{ cm}^2$$

$$\text{Area} = \frac{1}{2} a p$$

example 3:
regular triangle
apothem = 4 cm



$$A = \frac{1}{2} 4 \cdot 24\sqrt{3} = 48\sqrt{3} \text{ cm}^2$$

$$\text{Area} = \frac{1}{2} a p$$

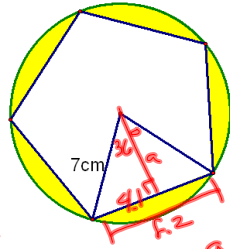
example 4:
regular pentagon
perimeter = 90 cm



$$A = \frac{1}{2} 12.4 (90) = 557.4 \text{ cm}^2$$

Example 5:

Find the area of the shaded region.



$$\begin{aligned}
 A_c - A_{\text{pentagon}} \\
 49\pi - \frac{1}{2} 5.66 (41.1) & \quad \cos 36^\circ = \frac{a}{7} \\
 & \quad 5.66 \approx a \\
 116.4 \\
 A \approx 37.6 \text{ cm}^2
 \end{aligned}$$

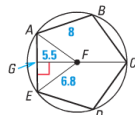
HW

p765-766

#s 1-4, 14-16, 27-29

VOCABULARY In Exercises 1–4, use the diagram shown.

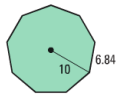
1. Identify the *center* of regular polygon $ABCDE$.
2. Identify a *central angle* of the polygon.
3. What is the *radius* of the polygon?
4. What is the *apothem*?

**FINDING AREA** Find the area of the regular polygon.


14.



15.



16.


 at classzone.com
POLYGONS IN CIRCLES Find the area of the shaded region.

27.



28.



29.

